

MASS COLLECTIONS: CAMASSIA SCILLOIDES

RALPH O. ERICKSON

University Fellow in the Shaw School of Botany of Washington University

In the St. Louis vicinity, *Camassia scilloides* (Raf.) Cory exhibits a considerable amount of variability, which is apparent on looking at a number of plants even casually. This fact has been given some recognition by the description of *C. scilloides* forma *Petersenii* Steyermark.¹ In the spring of 1940 an attempt was made to learn something about the statistical nature of the variation. "Mass collections" (Anderson,² Fassett³), each consisting of 25–50 or more inflorescences, and in some cases leaves, were made at the places which are cited in detail in the footnote,⁴ and which will be referred to as New Athens, Allenton, Meramec Highlands, Gray Summit and Spring Creek, respectively.

The plants of the first collection were first studied to decide what features of the variation could be most satisfactorily submitted to measurement. The dimensions of the inflorescence seemed most promising. The "open" appearance of some of the inflorescences, as contrasted with the compactness of others, seemed obviously related to internode length and pedicel length, and these lengths were measured in plants of each of the collections. There is considerable difference in length between successive internodes, so that instead of measuring a particular one, the length of the lowest eight was used.

¹ *Rhodora* 40: 178. 1938.

² *Ann. Mo. Bot. Gard.* 28: 287–292. 1941.

³ *Ann. Mo. Bot. Gard.* 28: 299–374. 1941.

⁴ ILLINOIS. ST. CLAIR CO.: in river-bottom woods, about 1 mile northwest of New Athens, May 7, 1940. MISSOURI. ST. LOUIS CO.: on top of a ridge, 2 miles south of Allenton, S. 10, T. 43N, R. 3E, April 28, 1940; along a steep south slope below the Frisco railroad tracks, at Meramec Highlands, S. 10, T. 44N, R. 5E, May 18, 1940. FRANKLIN CO.: at the "cliff," Missouri Botanical Garden Arboretum near Gray Summit, S. 17 & 20, T. 43N, R. 2E, April 21 and May 5, 1940; on a south slope at Spring Creek, 4 miles northwest of Stanton, May 11, 1940.

The lowest pedicel was measured in each inflorescence. Neither of these lengths changes appreciably after anthesis, and no inflorescences were measured in which at least half of the flowers had not bloomed. As a check, measurements of members of a few supposed clones were made, and were found to agree.

When internode length was plotted against petiole length in a scatter diagram, a simple picture of the variability within each collection was obtained. Not only was there variability

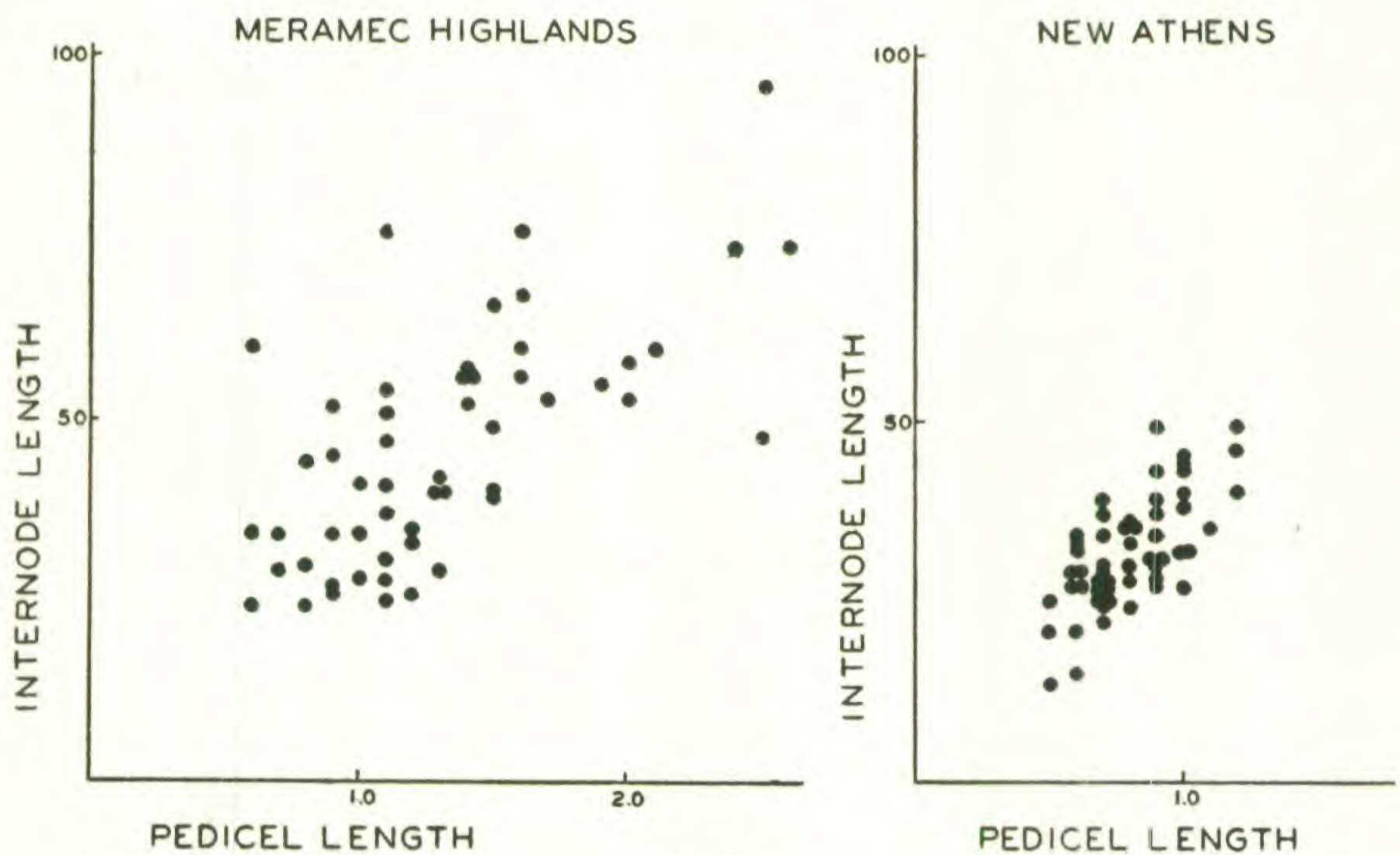


Figure 1.

within each of the colonies, but a striking difference was seen between colonies. The Meramec Highlands, Allenton, Gray Summit and Spring Creek collections, all of which were made within the Ozark region, produced essentially the same sort of scatter diagrams, while that for the New Athens material was quite different (see fig. 1). At New Athens the range of variation in these two characters is quite restricted as compared with Meramec Highlands and the other Ozark stations. Although the Meramec Highlands collection includes practically all the types represented at New Athens, most of the plants from Meramec Highlands lie completely outside the range of variation of the New Athens colony.

The same sort of difference in variability is shown by the scatter diagrams in fig. 2, where sepal length and width, as measured from camera-lucida drawings of fresh material, are plotted. (The difference, however, is not so pronounced; or is it exaggerated in the case of the internode and pedicel lengths by the use of an inappropriate scale?⁵)

Furthermore, the uniformity of the New Athens plants as compared with those collected in the Ozark localities is apparent in their general aspect, whether seen in the field or as dried

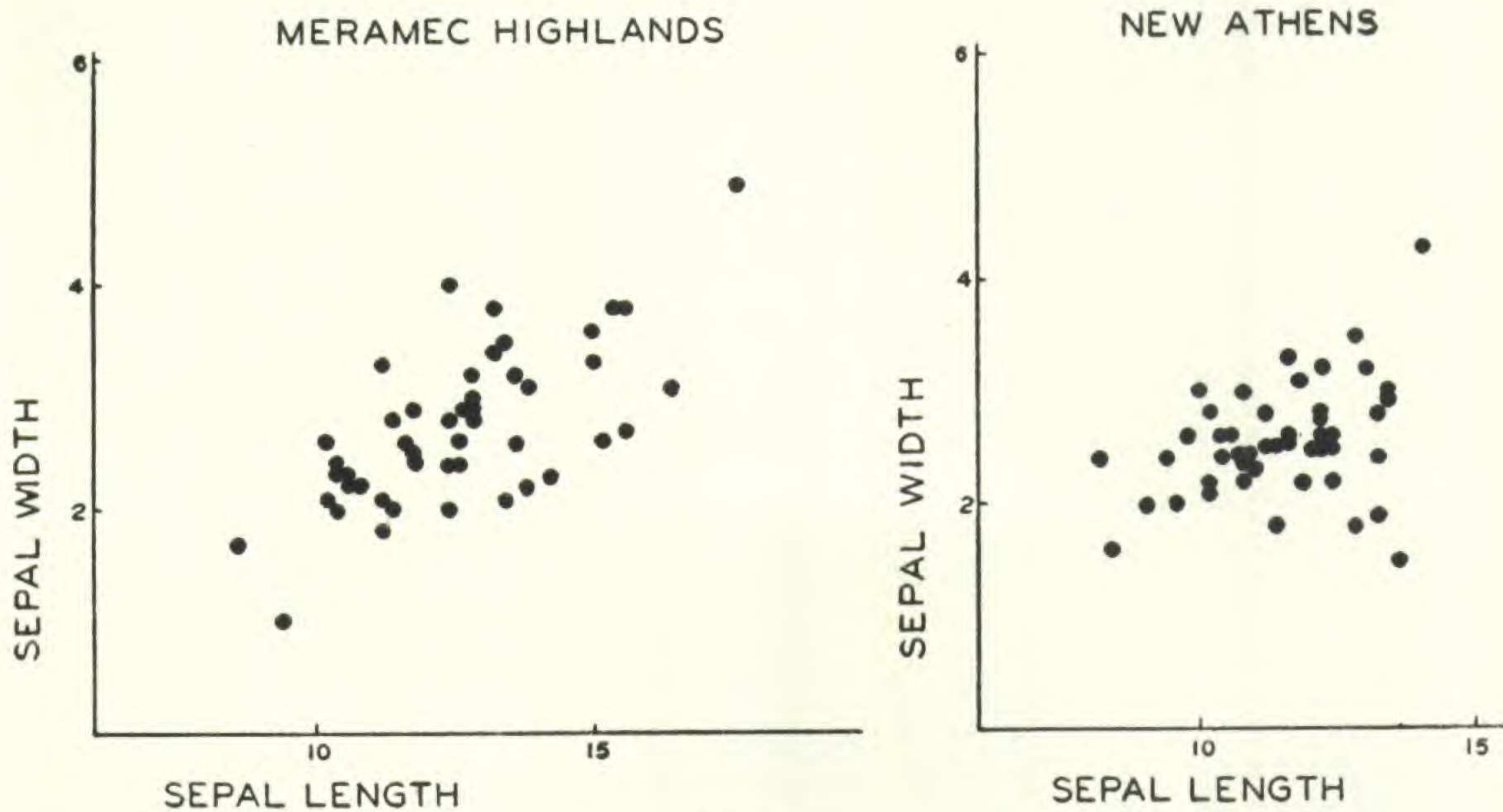


Figure 2.

specimens. See the photographs of dried inflorescences in pl. 8.

Many of the features of the variation which is so apparent in the Camassias of this region cannot be studied statistically, but some of them will be discussed in general terms here. The color of the flowers varies somewhat. While the prevailing color is a pure, pale blue, there is an appreciable range in the depth of the blue color, and in many plants a slight reddish tinge is perceptible. The petals (and sepals) vary both in size and shape, one of the details of the variation being the pres-

⁵ Wright in Jour. Amer. Stat. Assoc. 21: 162-178. 1926.

ence or absence of a sagittate base. It is also easy to see variation in style length and form.

The general aspect of the inflorescence presents easily apparent differences, as mentioned above. There are inflorescences which are decidedly cylindrical in shape, and others which appear more or less pyramidal, even when all allowances are made for the acropetal order of flowering. In some plants the inflorescence appears compact, with the flowers greatly crowded; in others it is open and spindly in appearance. The peduncle varies, the extremes being a stout and fleshy sort, and a quite slender and woody one. The bracts are usually inconspicuous and completely withered at anthesis, but plants can be found in which large green bracts, approaching in size the basal leaves, occur at the lowest few nodes of the inflorescence. The largest of these bracts do not subtend flowers. Incidentally, no such large, leaf-like bracts were found among the New Athens plants.

The leaves offer differences in size, and in the amount of bloom on the upper surface. There also appear to be differences in shape of the bulb, which are not connected with its size.

In all of the above-mentioned characters, the New Athens collection is less variable than are the other four.

Although the two collections which have been discussed in detail were made less than fifty miles apart, they are from quite different habitats, and for that matter from different physiographic regions. Meramec Highlands (as well as Allenton, Gray Summit and Spring Creek) is on the northeastern edge of the Ozark Plateau,⁶ and at these Ozark localities *Camassia* grows for the most part on steep slopes. New Athens is in the Till Plains section of the Central Lowland,⁶ and *Camassia* was there found growing in rich bottom-land soil. The former region is unglaciated, and has been occupied by plants continuously since preglacial times, while the latter was covered by the Illinoian ice sheet.

While it is not the purpose of this paper to offer a complete

⁶ Fenneman, *Physiography of the eastern United States*. New York. 1938.

explanation of the facts presented above, one might suppose that the differences which have been demonstrated between *Camassia* of the Ozarks and of the Illinois bottom-lands are related to the different vegetational histories of the two regions.

EXPLANATION OF PLATE

PLATE 8

Fig. 1. Photograph of ten specimens of *Camassia scilloides* from the mass collection made near New Athens, Ill. Scale is in centimeters.

Fig. 2. Photograph of ten specimens of *Camassia scilloides* from the mass collection made at Meramec Highlands, Mo.